

2.4GHz Telemetry System

Instruction Manual ver 1.0

Made in the Philippines



Introduction

Welcome to world of Hitec 2.4GHz Telemetry System!
Hitec's AFHSS telemetry system will bring you to the next step of your RC life.
The "HTS-SS Advanced is an optimized telemetry sensor station for electric model and nitro planes.
You can monitor your model's Air Speed, Variometer, Servo Managing, RPM, Temperature, Engine Temperature, Current, Voltage, Fuel level and GPS information including speed and altitude.
This system can be installed easily in almost any electric aircraft including.
Helicopters, gliders, acrobatic planes.
We advise you to read the manual thoroughly to familiarize yourself with the proper installation and usage procedure.

Warning, Caution, Tip and Note Boxes



Warning



Caution



Tip



Note

Before Use

Safety Information

Flying models can be dangerous if proper safety precautions are not followed.
Here are a few critical safety suggestions to keep you and others safe.

Are you Experienced?

Flying models is not an intuitive process. Most accomplished model pilots were taught by another modeler.
We encourage you to seek help during your early flight experiences and if necessary, during the building and gear installation processes as well.
Unlike some other hobbies, model airplane flying has evolved into a social event.
There are approximately 2,500 model aircraft clubs in America. Friendship and help could be right around the corner. Ask your local hobby shop about clubs in your area.

Where to Fly

Having enough land for your own model airport is rare. Most of us fly at club administrated model fields.
The local ball field can be tempting but rarely has the space needed, plus your liability is high should you damage property or hurt an innocent person.
We recommend you to fly at a sanctioned model aircraft field.

Join the AMA

In America, the Academy of Model Aeronautics (AMA) is an organization of model enthusiasts that provide resources and insurance to modelers.

The AMA also lobbies the US Government, concerning legislation that impacts modelers.

Visit their website for more information: www.modelaircraft.org

Academy of Model Aeronautics
5151 East Memorial Drive,
Muncie, Indiana 47302
Toll Free Call: 800 435-9262

Fundamental Guidelines for Safe Flying

Please follow the guidelines below for your safety and others around you:

1. Don't fly over people or personal property.
2. Make sure you do a range and pre-flight check on your aircraft.
3. Know the conditions of your batteries. Keep them charged.
4. Have receivers checked after a crash before using them in another aircraft.
5. Use the Fail-Safe function in AFHSS and QPCM mode to lower the throttle in case of a signal "lock-out."
6. Don't fly alone.

Product Support

HTS-SS Advanced System Support

While every attempt was made by the HTS-SS Advanced developers to make the system easy and simple, some users will require systematic and/or installation help at some points. There are several "get help" options available to you.

Hitec Customer Service

Help is available from Hitec customer service through phone support and e-mail inquiries.
Our US office is open Monday thru Friday, 8:00AM to 4:30PM PST. These hours and days may vary by season. We make every attempt to answer all incoming service calls;
should you reach our voicemail, please leave your name and number and a staff member will promptly return your call.

Hitec Website

We invite you to regularly visit our website at www.hitecrd.com for specification information and descriptions of our entire product line. Our FAQ pages provide valuable information about all Hitec products.

The Community

One of the benefits of the extensive RC on-line community is the vast wealth of archived information available. Hitec sponsors forums on most of the popular RC websites where a Hitec staff member or representative answers product-related questions. Bringing together strangers with common interests is proving to be one of the greatest gifts of the internet. If past history is any guide to the future, we are certain forums will be started about the Hitec Sensor Station creating valuable archived information for future access.

Warranty and Non-Warranty Service

All Hitec products carry a two-year warranty against manufacturing defects from date-of-purchase. Our trained, professional service representative will determine if the item will be repaired or replaced. Please complete and include the repair format www.hitecrd.com when you return your item so that we may administer your repair.

Hitec Service
12115 Paine St. Poway CA 92064
1-858-749-6948

E-mail : Service@hitecrd.com

Manufacturer/Country: HITEC RCD, INC./The Philippines



Features & Specifications

The type of sensor module

#55833 - O-RPM Sensor(O-RPM)	#55854 - Air Speed Sensor
#55834 - Temperature Sensor(HTS-TEMP)	#55860 - Variometer Sensor
#55836 - GPS Sensor(HTS-GPS)	#55859 - Servo Manager Sensor
#55842 - M-RPM Sensor(HTS-MRPM)	#55861 - Engine Temperature Sensor
#55850 - Current Sensor(50A)(HTS-C50)	#55835 - Fuel level Sensor.
#55855 - Current Sensor(200A)(HTS-C200)	#55853 - Advanced Sensor Staion
#55851 - Voltage Sensor(HTS-VOLT)	

- Dimension of Sensor Station : 40.4mm X 28.4mm X 11.7mm
- Operating Temperature Range: -20°C ~ 60°C
- Operating Voltage Range: 4.8V ~ 8.4V (Max: 2S LiPo)

Temperature sensor

- Operating Temperature : -40°C ~ 200°C	- Wire length: 350mm
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Optical sensor

- Maximum Operational Distance : 150mm	- Wire length : 500mm
- Measurement range : 0 ~ 50,000rpm	

Magnetic sensor

- Maximum Operational Distance : 1mm	- Wire length : 500mm
- Measurement range : 0 ~ 70,000rpm	

Current Sensor(50A)

-Measurement Range : 0 ~ 50A	-Wire Length : 250mm
-Measurement Resolution : 0.1A	

Current Sensor(200A)

-Measurement Range : 0 ~ 200A	-Wire Length : 250mm
-Measurement Resolution : 1A	

Voltage Sensor

-Wire Type : Crocodile Clip & T-Clamp

GPS

- UTC(Universal Time Coordinated)	- Satellite : No. of satellites
- Altitude: 0 ~ 9,999m	- Speed : 0 ~ 900Km/h
- Latitude : xxx°xx'xx.xx"	- Course(°) : 0~360°
- Longitude : xxx°xx'xx.xx"	

• Refresh time : 0.5 sec	• Wire length : 250mm
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Air Speed Sensor

- Measurement range : 0 ~ 900Km/h	- Wire length : 250mm
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Variometer Sensor

- Measurement range : 0 ~ 6,000m (Absolute), 0 ~ ±2,000m (Relative)
- Measurement Resolution : 1m
- Wire length : 250mm

Servo Manager Sensor

- Measurement range : 0 ~ 10A (4ch)	- Wire length : 250mm
- Measurement Resolution : 0.1A	

Engine Temperature Sensor

-Operating Temperature : -40°C ~ 200°C	- Wire length : 500mm
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Fuel level Sensor

-Measurement range : 4 point	- Wire length : 250mm
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HTS-SS (ADVANCE)

Collects the data from the sensors and passes it to the Optima series receivers.

D : DATA
G : GPS
M1 : AIR SPEED
M2 : SERVO MANAGER
M3 : VARIOMETER
R1,R2 : ORPM & MRPM

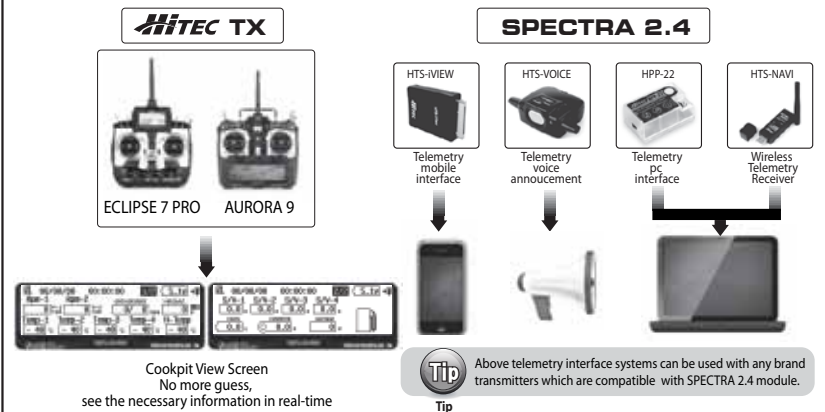


P : POWER
T5: ENGINE TEMP
T1~T4 : TEMP
F : FUEL
C : CURRENT
V : VOLT

Optima 7/9 Receiver

Takes data from HTS-SS Advanced and transmits it to the AFHSS 2.4GHz module.

Hitec 2.4GHz Telemetry Displays



G



HTS-GPS (GPS Sensor)

Hitec's GPS sensor is specially designed for RC applications, unlike conventional single dimension GPS sensors, such as car navigation, the five dimensional cube antenna has been implemented to cover dynamic movement of RC aircraft. As a result, it can receive stable GPS information, even during 3D flight.



- When the system boots up for the first time, the position recognition time may be slow depending on where you are. Once it connects, it memorizes its last location for about four hours. When the system reboots at the same location within that four hour time period, the position recognition time will be significantly shortened.
- During extreme 3D flight, the signal can be lost. If this happens, try to stabilize the aircraft until the connection is reestablished.

Note

M1



HTS-AIR SPEED (Air Speed Sensor)

The new air speed sensor provides exact speed information by Pitot Tube sensing. This sensor provides more accurate and faster response than the GPS sensor.



- The provided Pitot Tube must be placed in a safe location where it isn't affected by the slip stream of the propeller. If Pitot Tube is bent or the silicon tube is distorted, air speed will not be read accurately.

Note



- The Pitot Tube must be placed in the direction of the plane and remain level with the plane.

Caution

M2



HTS-SERVO MANAGER (Servo Manager Sensor)

Servo manager sensor shows each 4 servo's current consumption in real time between the range of 0.1A ~ 10A.



- Be sure to check each channel before plugging it in. If not, the servo may operate in a different channel and be damaged.

Note

M3



HTS-VARIOMETER (Variometer Sensor)

The variometer sensor can read altitude by detecting the atmospheric pressure difference and it is more accurate and responses faster than the GPS sensor (1m resolution). The altitude of the plane can also be measured in indoor flying field.



- Since weather conditions may influence the readout, to insure the most accurate reading, make sure you install the sensor as far away from the fly bar paddles as possible.

Note

R1



HTS-ORPM (RPM Sensor)

The optical RPM sensor has been made for use with larger, outdoor helicopters. Installation is simple. Attach it to the boom and connect it to the sensor station. It can read from 0 to 50,000 RPM.



- Since weather conditions may influence the readout, to insure the most accurate reading, make sure you install the sensor as far away from the fly bar paddles as possible.

Note

R2



HTS-MRPM (RPM Sensor)

The magnetic RPM sensor has been developed for indoor aircraft and for applications when the O-RPM sensor is too big to be installed. This will give you a much more accurate reading.



- For optimum performance, make sure the distance between the magnet and the sensor is less than 1mm.

Note

T5



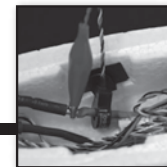
T1~T4



F



C



V



HTS-ENGINE TEMP (Engine Temperature Sensor)

The engine temperature sensor can be attached directly to the engine by using the provided metal socket. The sensor can measure from -40°C to 200°C. Metal housing and Teflon wire coating have made the new temperature sensor more durable than the previous one by being able to resist the heat and vibration from the engine.

HTS-TEMP (Temperature Sensor)

The temperature sensors can measure up to four different temperature locations. Wrapped with high-temperature, shrink resistant tubing, these sensors can read temperatures from -40°C to 200°C. These sensors can be used almost anywhere.

HTS-FUEL (Fuel Level Sensor)

The fuel level sensor indicates five levels of fuel (Full, 3/4, 1/2, 1/4, Empty) to the flier. Installation is easy. Simply stick the sensor outside of the fuel tank and fly. It can even read the values during inverted flight.



- Power up the system prior to fueling.
- During extreme 3D flight, the reading may become inaccurate. If this happens, try to hover (for heli) and flatten out (for plane) for a few seconds to reestablish an accurate reading.



- The fuel sensor is made to be used with glow fuel only

Caution

HTS-C50, HTS-C200 (Current Sensor)

HTS-C50 & C200, the current sensors, have been specially designed to measure current status accurately & conveniently. There are two types according to measurable current amount & resolution, C50 has delicate sensing (0.1Amp per unit) capacity and C200 for high current sensing (1Amp per unit) capacity.



- Make sure to fix the current sensor firmly to get accurate and consistent value.
- Pay close attention to the direction of arrow marked on the sensor and it should be synchronized with the direction of electric current.
- Make sure not to install the sensor near to the magnet as it will create unexpected interference.
- Please note each current sensors can be influenced each other if they are installed in very near distance.
- The wire should be located in the center of sensor's hole to get more accurate current value.

Note

HTS-VOLT (Voltage Sensor)

Two types of voltage sensors(connectors) available according to the installation area & user's convenience. Measureable range is 0 to 100V. T-clamp type connector provides firmer & safer installation, but please note that this is NOT a renewable item. Alligator type connector enables you to measure the voltage anywhere you want.



- Be careful not to make unexpected short circuit after the installation of Alligator type connector.

Caution



*How to install T-clamp type connector



Wattage can be measured when both current & voltage sensors are installed properly.

Tip